



## NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

**36 CFR Parts 1224, 1225, and 1236**

**[FDMS No. NARA-20-0006; NARA-2021-001]**

**RIN 3095-AB99**

### **Federal Records Management: Digitizing Permanent Records and Reviewing Records Schedules**

**AGENCY:** National Archives and Records Administration (NARA).

**ACTION:** Proposed rule.

**SUMMARY:** We are proposing to amend our electronic records management regulations to add a subpart containing standards for digitizing permanent Federal records so that agencies may dispose of the original source records, where appropriate and in accordance with the Federal Records Act amendments of 2014. We are also making a minor revision to our records schedule review provisions to establish a requirement for agencies to review, every five years, all records schedules that are ten years old and older, based on the date the National Archives and Records Administration (NARA) approved the schedule.

**DATES:** Submit comments on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may submit comments, identified by RIN 3095-AB99, by either of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the site's instructions for submitting comments.
- *Mail* (for paper, flash drive, or CD-ROM submissions. Include RIN 3095-AB99 on the submission): We normally accept mail submissions, but due to the current COVID-19 pandemic, we do not have usual staff presence at the building and mail is likely to be delayed significantly past the comment period. If you wish to submit comments by cannot do so through

the eRulemaking portal, please contact us at the number below so we can work with you to make alternate arrangements.

Instructions: All submissions must include NARA's name and the regulatory information number for this rulemaking (RIN 3095-AB99). We may publish any comments we receive without changes, including any personal information you include.

**FOR FURTHER INFORMATION CONTACT:** Kimberly Keravuori, by email at [regulation\\_comments@nara.gov](mailto:regulation_comments@nara.gov), or by telephone at 301.837.3151. Contact [rmstandards@nara.gov](mailto:rmstandards@nara.gov) with any questions on records management and digitization.

## **SUPPLEMENTARY INFORMATION:**

### **Background**

We propose to amend 36 CFR part 1224, Records Disposition Programs, and 36 CFR part 1225, Scheduling Records, to set a timeframe for required review of existing records schedules. The current regulations state that schedules should be reviewed "regularly." This rulemaking clarifies the word "regularly" by establishing a timeframe for those recurring reviews. This is based upon investigation that determined that many schedules have not been being kept up to date or revised when needed. We propose revising the regulations to require that every five years agencies must review records schedules that are ten years old or older, based on the date NARA approved the schedule.

In addition, we propose to amend 36 CFR part 1236, Electronic Records Management, to add a new subpart establishing standards for digitizing permanent paper and photographic records, including paper and photographs contained in mixed-media records. In 2014, the Federal Records Act at 44 U.S.C. 3302 was amended by Public Law 113-187 to require NARA to issue standards for reproducing records digitally 'with a view to the disposal of the original records.' The amendment applies to both temporary and permanent records.

This rulemaking covers only permanent records of the kinds listed above. We previously amended 36 CFR part 1236 to add standards for digitizing temporary records, which constitute

the majority of Federal records (RIN 3095-AB98, 84 FR 14265 (April 10, 2019), effective May 10, 2019). We plan to issue additional digitizing requirements for other specific media types in future revisions to the rule. In the interim, agencies should contact [rmstandards@nara.gov](mailto:rmstandards@nara.gov) about digitizing other types of permanent records.

Permanent records are approved by the Archivist of the United States as having sufficient historical or other value that warrants continuing to preserve them beyond the time agencies need the records for administrative, legal, or fiscal purposes. Agencies retain permanent records for administrative, legal, or fiscal purposes for a specific period of time. At the end of the scheduled retention period, they then transfer permanent records to the legal custody of the National Archives.

These digitizing standards for permanent records ensure that agencies can continue to use digital versions for the same business purposes as the original records, and that the digital records will be appropriate for preserving in NARA's archival holdings. We intend the regulation to be neutral about who performs the digitizing activities for the agency, whether a parent agency, a component agency, a vendor or other similar entity acting on the agency's behalf.

This proposed rulemaking defines the requirements for digitizing as a records management activity, drawing from principles within the Federal Agencies Digital Guidelines Initiatives (FADGI), Technical Guidelines for Digitizing Cultural Heritage Materials Creation of Raster Image Files (2016), and from International Organization for Standardization (ISO) Technical Specifications (TS) and Technical Reports (TR); specifically ISO/TR 13028:2010, Information and documentation - Implementation guidelines for digitizing records. It also provides agencies with guidance necessary to proceed with projects for digitizing and disposing of original source permanent records. These technical digitizing standards apply to both unclassified and classified national security records. However, this rulemaking does not address other standards specific to classified information, such as classified-specific metadata or acquiring secure equipment.

These subjects do not fall under our records management authority and are outside the scope of this regulation.

The standards in this proposed rulemaking apply retroactively to digitized permanent records that have not been transferred to the National Archives. If agencies determine their previously digitized records are not in compliance with these standards, re-digitizing may be necessary. Re-digitizing the records will allow agencies to use the GRS as the authority to destroy the original paper source records and transfer the new digitized records to NARA. However, if agencies' previously digitized records can't meet the requirements in this proposed regulation, they also have other options: (1) send the paper versions of the permanent records for storage to NARA's Federal records centers by December 31, 2022; (2) work with us to develop an agency-specific records schedule that addresses the previously digitized records, providing authority to transfer the electronic records to NARA and destroy the original source records (this option is available if NARA determines the previously digitized records are acceptable permanent records, even if the scanned versions were digitized to standards that differ from the ones in this regulation); or (3) request an exception as part of the agency's strategic response to meeting the OMB/NARA Memorandum M-19-21 goals (see NARA Bulletin 2020-01, Guidance on OMB/NARA Memorandum Transition to Electronic Records (M-19-21) at <https://www.archives.gov/records-mgmt/bulletins/2020/2020-01> for details on agency strategic response requirements and exceptions). Some agencies might find a combination of these options will be needed to address any issues with previously scanned paper records.

While this rulemaking is proposed and under development, we recommend that agencies discuss digitization projects with their general counsel and agency records officer before disposing of original permanent records. Agencies should also continue to follow the process in the General Records Schedule, 36 CFR 1225.24, and NARA Bulletin 2010-04, Guidance Concerning Notifications for Previously Scheduled Permanent Records (<https://www.archives.gov/records-mgmt/bulletins/2010/2010-04.html>).

## **Regulatory analysis**

*Review under Executive Order 12866, Regulatory Planning and Review, 58 FR 51735 (September 30, 1993), and Executive Order 13563, Improving Regulation and Regulation Review, 76 FR 23821 (January 18, 2011)*

The Office of Management and Budget (OMB) has reviewed this rulemaking and determined it is not “significant” under section 3(f) of Executive Order 12866. It is not significant because it applies only to Federal agencies, updates the regulations due to a statutory requirement, to incorporate technological developments, and to account for increased rapidity in changing technology and agency practices, and is not establishing a new program. Although the proposed revisions change and add new requirements for agencies, the requirements are necessary to keep the existing regulations up-to-date, comply with the statute, and ensure agencies are preserving records for the United States.

*Review under the Regulatory Flexibility Act (5 U.S.C. 601, et seq.)*

This review requires an agency to prepare an initial regulatory flexibility analysis and publish it when the agency publishes the proposed rule. This requirement does not apply if the agency certifies that the rulemaking will not, if promulgated, have a significant economic impact on a substantial number of small entities (5 U.S.C. 603). We certify, after review and analysis, that this rulemaking will not have a significant adverse economic impact on small entities.

*Review under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)*

This rulemaking does not impose additional information collection requirements subject to the Paperwork Reduction Act on the public.

*Review under Executive Order 13132, Federalism, 64 FR 43,255 (August 4, 1999)*

Review under Executive Order 13132 requires that agencies review regulations for Federalism effects on the institutional interest of states and local governments, and, if the effects are sufficiently substantial, prepare a Federal assessment to assist senior policy makers. This

rulemaking will not have any effects on state and local governments within the meaning of the Executive Order. Therefore, no Federalism assessment is required.

*Review under Executive Order 13771, Reducing Regulation and Controlling Regulatory Costs, 82 FR 9339 (February 3, 2017)*

Review under E.O. 13771 seeks to reduce Federal regulations that impose private expenditures in order to comply with them, and to control those costs in any such regulations. OMB has reviewed this rulemaking and determined that it is exempt from E.O. 13771 requirements. This rulemaking is exempt because it applies only to Federal agencies, involves agency organization, management, or personnel, modifies an existing rule, and does not involve regulatory costs subject to the Executive Order.

*Review under the Unfunded Mandates Reform Act (Sec. 202, Pub. L. 104-4; 2 U.S.C. 1532)*

Review under the Unfunded Mandates Reform Act requires that agencies determine whether any Federal mandate in the rulemaking may result in state, local, and tribal governments, in the aggregate, or the private sector, expending \$100 million in any one year. NARA certifies that this rulemaking does not contain a Federal mandate that may result in such an expenditure, and this rulemaking is therefore not subject to this requirement.

## **List of Subjects**

### **36 CFR Parts 1224 and 1225**

Archives and records, Record-keeping, Records disposition, Records management, Records schedules, Scheduling records

### **36 CFR Part 1236**

Archives and records, Digitization, Digitized records, Digitizing, Electronic mail, Electronic records, Metadata, Permanent records, Record-keeping, Records management, Quality assurance, Quality control, Quality management, Temporary records

For the reasons discussed in the preamble, NARA proposes to amend 36 CFR parts 1224, 1225, and 1236 as follows:

## **PART 1224 – RECORDS DISPOSITION PROGRAMS**

1. The authority citation for part 1224 continues to read as follows:

**Authority:** 44 U.S.C. 2111, 2904, 3102, and 3301.

2. In § 1224.10, in paragraph (c), add two sentences at the end to read as follows:

### **§ 1224.10. What must agencies do to implement an effective records disposition program?**

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(c) \*\*\* Every five years, agencies must review all records schedules that are ten years old and older, based on the date NARA approved the schedule. *See* § 1225.22 of this subchapter.

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## **PART 1225 – SCHEDULING RECORDS**

3. The authority citation for part 1225 continues to read as follows:

**Authority:** 44 U.S.C. 2111, 2904, 2905, 3102, and Chapter 33.

4. Amend § 1225.22 by:

- a. Revising the section heading and the introductory text; and
- b. In paragraph (a), by removing the words “an SF 115” and adding in their place the words “a new records schedule”.

The revisions read as follows:

### **§ 1225.22 When must agencies reschedule or review their records schedules?**

Agencies should review their records schedules on a regular basis to determine if they remain accurate. Every five years, agencies must review all records schedules that are ten years old and older, based on the date NARA approved the schedule. Agencies must submit a new records schedule to NARA in the following situations:

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## **PART 1236 -- ELECTRONIC RECORDS MANAGEMENT**

5. The authority citation for part 1236 continues to read as follows:

**Authority:** 44 U.S.C. 2904, 3101, 3102, 3105, 3301, 3302, and 3312.

6. In § 1236.2, revise the section heading, and in paragraph (b) add definitions in alphabetical order for “Administrative metadata”, “Checksum”, “Descriptive metadata”, “Embedded metadata”, “Intellectual control”, “Media”, “Mixed-media files”, “Physical control”, “Quality assurance (QA)”, “Quality control (QC)”, “Quality management (QM)”, and “Technical metadata” to read as follows:

**§ 1236.2 Definitions that apply to this part.**

\* \* \* \* \*

(b) \* \* \*

*Administrative metadata* are elements of information used to manage records and relate them to one another. Administrative metadata elements describe how a record was created, any access and use restrictions that apply to it, information about the record series to which it belongs, and the disposition schedule that identifies its retention period.

*Checksum* is a function that takes an input string, which can be of any length, and generates an output of fixed length. The output, or hash, is used to authenticate information, such as whether a file has been corrupted or modified. The values returned by a hash function are called hash values, hash codes, digests, or simply hashes.

*Descriptive metadata* are elements of information that describe the records or set of records itself. They apply to both the original source records and any versions produced through digitization. Descriptive metadata elements for individual source records include such elements as the title of a record, a description of its contents, its creator, and the date it was created. These elements support searching for and discovering records.

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*Embedded metadata* are textual components that exist alongside the content (usually binary data) within the file. Embedded metadata may be used to make self-describing digital files that contain specified administrative, rights, and technical metadata and can be appropriately managed outside of a recordkeeping system.



*Intellectual control* is having the information necessary to identify and understand the content and context of the records. This includes knowing the disposition schedule under which the records fall, the date range when the records were created, and any access or use restrictions that apply to the records.

*Media* are the physical forms on which records are stored, such as paper, photographs, compact discs, DVDs, analog tapes, flash drives, local hard drives, or servers.

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*Mixed-media files* include records in different forms of media. A file, when used in the phrase “mixed-media file,” is a group of records -- regardless of location and type of media -- that belong together or relate to a topic, such as a case file. For example, a mixed-media case file could be a box with paper notes, audio recordings of interviews, and a CD of photographs, along with physical evidence stored separately in an evidence locker. Records in a file may be in more than one media type due to changes in how agencies create, maintain, and use records, shifts in technology, and the topic or activity involved.

*Physical control* is having the information necessary to physically manage the records. This includes knowing where the records are housed, whether any records that fall within the project’s scope are missing or stored separately, and the records’ physical form (such as media types, the records’ dimensions, and the smallest level of detail used to convey information).

*Quality assurance (QA)* are the proactive quality management (QM) activities focused on preventing defects by ensuring that a particular product or service achieves certain requirements or specifications. A QA program is heavily dependent on quality control (QC) data to search for patterns and trends. QA activities also include controlled experiments, design reviews, and system tests. QA programs can improve quality through creating plans and policies or creating and conducting training.

*Quality control (QC)* are activities that examine products through inspection or testing to determine if they meet their specifications. The purpose is to detect defects (deviations from predetermined requirements) in products or processes.

*Quality management (QM)* are the overall management functions and underlying activities that determine quality policies, objectives, and responsibilities, and implement them through planning, control, assurance, and improvement methods within the quality system.

*Technical metadata* are elements of information that describe processes used to create electronic files, and parameters that aid a system in rendering the files properly. Technical metadata may include elements such as a file's byte size, file format and version, color encoding, and the type of equipment used to make the file (camera name, scanner manufacturer, etc).

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7. Add subpart E to read as follows:

#### **Subpart E -- Digitizing Permanent Federal Records**

Sec.

1236.40 Scope of this subpart.

1236.41 Definitions for this subpart.

1236.42 General requirements.

1236.44 Preparing records for digitization.

1236.46 Project management and documentation requirements.

1236.48 File format requirements.

1236.50 Digitization requirements for permanent paper and photographic print records.

1236.52 Digitization requirements for permanent mixed-media files.

1236.54 Metadata requirements.

1236.56 Quality control (QC) inspection requirements.

1236.58 Validating digitized records and disposition instructions.

#### **Subpart E -- Digitizing Permanent Federal Records**

##### **§ 1236.40 Scope of this subpart.**

(a) This subpart covers the standards and procedures you (an agency, employee, or agents acting on the agency's behalf, such as contractors) must apply when digitizing permanent paper records using reflective digitization techniques. Such records include most paper-based documents regardless of size, such as modern office paper, maps, posters, manuscripts, graphic-

arts prints (lithographs, intaglio, etc.), drawings, bound volumes, and photographic prints. This subpart also covers any records that may be incorporated into mixed-media records.

(b) This subpart does not cover standards and procedures you must apply when digitizing permanent records using transmissive digitization techniques. Such records include photographic negatives, transparencies, aerial film, roll film, and micrographic and radiographic materials. In addition, this subpart does not cover records on dynamic media, such as motion picture and audio-visual records, videotapes, and audio cassette tapes.

(c) For guidance on digitizing out-of-scope media types or non-paper-based portions of mixed-media records, such as dynamic media, x-rays, negative or positive film, or other special media types, please contact the Records Management Policy and Standards Team by email at [rmstandards@nara.gov](mailto:rmstandards@nara.gov) or by phone at 301.837.1948.

(d) This subpart also does not cover standards and procedures for optical character recognition (OCR) technology. You may perform OCR during digitization to meet agency business needs and transfer the resulting files to NARA, but this subpart does not require OCR.

(e) This subpart does not address other applicable laws and regulations governing documents and electronic files, including, but not limited to, proper handling of classified or controlled unclassified information and compliance with 36 CFR part 1194 (which establishes requirements for compliance with section 508 of the Rehabilitation Act). You should work with your legal counsel and other officials to ensure compliance with these and other applicable requirements.

(f) This subpart also does not address other business needs or legal constraints that may make it necessary for an agency to retain original source records for a period of time after digitizing. You should work with your agency legal counsel to determine whether such retention might be necessary because it relates to rights and interests, appeal rights, benefits, national security, litigation holds, or other similar reasons.

#### **§ 1236.41 Definitions for this subpart.**

In addition to the definitions contained in § 1236.2 and 36 CFR part 1220, the following definitions apply to this subpart:

*Batch* is a group of files that are created under the same conditions or are related intellectually or physically. During digitization, batches represent groups of records that are digitized and undergo QC inspection processes together.

*Color encoding accuracy* is measured in DICE by computing the color difference ( $\Delta E_{2000}$ ) between the digital imaging results of the standard target patches and their pre-measured color values. By imaging the DICE target and evaluating through the DICE software, variances from known values can be determined, which is a good indicator of how accurately the system is recording color. DICE measures the average deviation of all color patches measured (the mean).

*Color channel misregistration* measures the spread of red, green, and blue light in terms of pixel misregistration. This parameter is used to evaluate lens performance. The vernacular term for this is called color fringing.

*Color management* is using software, hardware, and procedures to measure and control color in an imaging system, including capture and display devices.

*Digital Image Conformance Evaluation (DICE)* is the measurement and monitoring component of the Federal Agencies Digital Guidelines Initiative (FADGI) Conformance Program. DICE consists of ISO-compliant reference targets and analysis software for testing and monitoring digitization programs to ensure they meet FADGI technical parameters. You can access DICE online at <http://www.digitizationguidelines.gov/guidelines/digitize-OpenDice.html>.

*Digitization project* is any action an agency (including an agent acting on the agency's behalf, such as a contractor) takes to digitize permanent records. For example, a digitization project can range from a one-time digitization effort to a multi-year digitization process; can involve digitizing a single document into an electronic records management system or digitizing

boxes of records from storage facilities; or can include digitizing active records as part of an ongoing business process or digitizing inactive records for better access.

*Digitized record* is an electronic record created by converting paper or other media formats to a digital form that is of sufficient authenticity, reliability, usability, and integrity to serve in place of the original source record.

*Dynamic range* is the ratio between the smallest and largest possible values of a changeable quantity, frequently encountered in imaging or recorded sound. Dynamic range is another way of stating the maximum signal-to-noise ratio.

*Federal Agencies Digital Guidelines Initiative (FADGI)* is a collaborative effort by Federal agencies to articulate Technical Guidelines that form the basis for many of the digitization technical parameters in this Part, which equate to the FADGI three-star level. You can access FADGI online at <http://www.digitizationguidelines.gov/guidelines/digitize-technical.html>.

*Image quality* measures a digital image's overall accuracy in faithfully reproducing an original. A digital image created to a high degree of accuracy meets or exceeds objective performance attributes (such as level of detail, tonal and color fidelity, and correct exposure), and has minimal defects (such as noise, compression artifacts, or distortion).

*Lightness non-uniformity* measures how evenly a lens records the lighting of neutral reference targets from center to edge and between points within the image.

*Mass digitization* is the large-scale scanning of source records using scanners capable of high-volume throughput. Mass digitization approaches are appropriate for paper records of uniform size and type that can be digitized without being damaged by the equipment, and in which there is no information requiring higher specifications to ensure accurate capture (such as fine detail or precise color accuracy).

*Modulation transfer function (MTF)/spatial frequency response (SFR)*. MTF is the modulation ratio between the output image and the ideal image. SFR measures the imaging

system's ability to maintain contrast between increasingly smaller image details. Using these two functions, a system can make an accurate determination of resolution related to sampling frequency.

*Noise* is an undesirable image artifact(s) in a digitized record that is not part of the original source material.

*Raster image* is a digitally encoded representation of a subject's tonal and brightness information into a bitmap. Data from digital cameras and scanning devices record light characteristics as numerical values into a grid, or raster, of picture elements (pixels). Raster data differs from vector data, in which geometrical points, lines, curves, and shapes are based upon mathematical equations, thus creating an image without specific data-to-pixel mapping.

*Reference target* is a chart of test patterns with known values used to evaluate the performance of an imaging system.

*Reflective digitization* is a process in which an imaging system captures reflected light off of scanned objects such as bound volumes, loose pages, cartographic materials, illustrations, posters, photographic prints, or newsprint.

*Reproduction scale accuracy* measures the relationship between the physical size of the original object and the size in pixels per inch (ppi) of that object in the digital image.

*Resolution* is the level of spatial detail an imaging system can resolve in an image.

*Sampling frequency* measures the imaging spatial resolution and is computed as the physical pixel count or pixels per unit of measurement, such as pixels per inch (ppi). This parameter provides information about the size of the original and the data needed to determine the level of detail recorded in the file. (*See also* modulation transfer function (MTF)/spatial frequency response (SFR) above.)

*Sharpening* artificially enhances details to create the illusion of greater definition. Image quality testing using the SFR quantifies the level of sharpening introduced by imaging systems or applied by users in post-processing actions.

*Source record or original source record* is the record from which a digitized version or digitized record is created.

*Spatial resolution* determines the amount (quantity, ppi, megapixels, etc.) of data in a raster image file in terms of the number of picture elements or pixels per unit of measurement, but it does not define or guarantee the quality of the information. Spatial resolution defines how finely or widely spaced the individual pixels are from each other. The actual rendition of fine detail is more dependent on the spatial frequency response (SFR) of the scanner or digital camera.

*Tone response or opto-electronic conversion function (OECF)* is a measure of how accurately the digital imaging system converts light levels into digital pixels.

*Transmissive digitization* is a process in which the system transmits light through a photographic slide or negative.

*White balance error* measures the digital file's color neutrality. When the balance is neutral, a white patch in the reference target should be recorded as even values across red, green, and blue channels, with a value approaching the limit of the file format to define white.

#### **§ 1236.42 General requirements.**

(a) *Purpose and objectives.* This subpart establishes processes and requirements to ensure that agencies:

- (1) Identify the scope of each digitization project;
- (2) Account for all records included in the scope of the digitization project regardless of their media type;
- (3) Produce complete and accurate digitized records that can be used for all the same purposes as the originals; and
- (4) Validate that the resulting digitized records meet the standards required in § 1236.58 for replacing permanent Federal records.

(b) *Records management requirements.* You must comply with existing records management requirements identified in 36 CFR part 1222 and other subparts of this part. You must also place digitized records in a system that can successfully produce and manage the records over time and must ensure you have intellectual and physical control over source records sufficient to support digitization. Having and maintaining an appropriate level of intellectual and physical control over source records is critical to a digitization project's success, regardless of whether the agency, or an agent acting on the agency's behalf (such as a contractor), performs the digitization activities.

(1) You must establish and document all the elements of intellectual control. *See* definition at § 1236.2.

(2) You must also establish and document all the elements of physical control. *See* definition at § 1236.2. For more information on documenting the smallest level of detail, *see* § 1236.50(c)(2).

(i) Understanding the physical properties of source records is necessary to properly identify a project's scope and acquire appropriate equipment.

(ii) Non-standard media, such as post-it notes, envelopes, or onion-skin paper, may require special handling and equipment. Using improper equipment may result in damage to original records.

(iii) You must also document any records that you cannot digitize according to the standards in this subpart.

(iv) For more information about selecting equipment and about records that need special handling, please contact the Records Management Policy and Standards Team by email at [rmstandards@nara.gov](mailto:rmstandards@nara.gov) or by phone at 301.837.1948.

(3) Before starting a digitization project, you must have intellectual and physical control over the original records that will be included in the project. In addition, you must create an inventory of records you will digitize, ensure that the proposed series are complete, document



any missing records or gaps in coverage as described in § 1236.46, document any restrictions relating to the source records that will also apply to digitized records, and note them as metadata as required in § 1236.54. You will need to maintain intellectual and physical control over the records throughout the project.

(4) You must also document the contents of any electronic or analog storage media, such as CDs, DVDs, or magnetic tapes, you discover when preparing records for digitization.

(i) Determine whether any files on the storage media are records. If the files are non-records, you may dispose of them.

(ii) If the files are records and are part of the same records series you are digitizing, handle them as described in § 1236.52.

(iii) If the files are records but not part of the record series you are digitizing, locate their disposition schedule and migrate them to an electronic information system that complies with the requirements in §§ 1236.10 through 1236.14.

(c) *Quality management (QM) requirements.* To be successful at digitizing permanent records, you need to minimize errors throughout the project, beginning as early in the digitization process as possible. You must therefore develop a quality management (QM) plan that ensures the project meets the quality assurance (QA) objectives and quality control (QC) inspections procedures in §§ 1236.42 through 1236.56. This includes defining requirements, implementing a testing and analysis process, performing corrective measures, and verifying that products conform to the requirements. The plan must document QC procedures and image and metadata quality inspection processes necessary to identify and correct deviations throughout all phases of the project.

(d) *Image quality requirements and QA.* The project must meet the image quality performance parameters, such as resolution, tone, and color accuracy, defined in § 1236.2 and specified in § 1236.50.

(1) To determine whether equipment meets the image quality requirements, you must scan a reference target with the device and measure the results with analytical software to determine how well the digital imaging equipment's optical resolution, sensor size, and signal processing perform against the performance evaluation technical parameters in § 1236.50(c). Results that fall within the performance metric value's tolerance range confirm the equipment meets the requirements. Equipment specifications, such as scanner ppi settings or camera sensor megapixels, are theoretical resolution claims and do not ensure digital image quality.

(2) To ensure image quality of digital files you create during the project, you must also monitor the digitization workflow by digitizing reference targets and analyzing the results against the technical parameters in § 1236.50(c). When all the measurements fall within the technical parameters' performance metric value tolerance range, the digital files meet the image quality objectives. This image QC process is a major component of your project's QA program.

(3) Your agency must use image QA processes to:

(i) Determine whether equipment performance meets specifications before you select the equipment;

(ii) Evaluate internal or external vendor imaging systems against image specifications;

(iii) Monitor device performance during digitization; and

(iv) Verify that resulting digital files meet project specifications.

(e) *Image QC standards.* You must have an image quality testing and analysis process that ensures the resulting digitized records conform to the requirements in § 1236.50. You should adopt methods consistent with the Federal Agencies Digital Guidelines Initiative (FADGI) Digital Image Conformance Evaluation (DICE) program (*see* § 1236.41 for a description of DICE) to ensure you meet digitization image quality parameters, but you do not have to use DICE to do so. Any method that ensures you meet the image quality parameters in § 1236.50 is acceptable.

(1) The DICE program, or other automated QC tools you select, should work in concert with manual inspection practices.

(2) If you do not adopt DICE, you must document the image quality measurement and monitoring procedures and reference targets you use instead, and how you verify quality conformance.

(3) FADGI also describes many recommended best practices which you may use to supplement, but not supersede, applicable regulations and NARA implementing guidance.

(f) *Image quality parameters.* Section 1236.50 outlines the set of performance parameters you must use. These parameters equate to FADGI three-star aimpoints and tolerance ranges. The FADGI Guidelines incorporate image quality specifications, testing methodology, and analyses that are compliant with ISO/TS 19264-1:2017 (Photography — Archiving systems — Image quality analysis — Part 1: Reflective originals) for digitizing cultural heritage materials. We are not incorporating the FADGI Guidelines in their entirety because they include general digitization practices outside the scope of this subpart. However, you may find it helpful when implementing this subpart to consider FADGI discussions, analyses, and papers related to the technical digitization parameters, especially if you are digitizing special or sensitive materials.

(g) *Inspection of digitized files.* You must inspect the resulting digitized files to check that they meet the digital file, image quality, and metadata specifications. Sections 1236.48 through 1236.56 describe digital file quality criteria your agency must inspect through a combination of automated and manual methods outlined in § 1236.56 to verify compliance with these digital imaging specifications.

#### **§ 1236.44 Preparing records for digitization.**

(a) A successful digitization project relies on maintaining source records in their original order throughout the process, capturing all the information and characteristics of the source material, and performing visual and automated QC inspections at multiple stages during a project to ensure the resulting digital record is complete.

(b) Image quality and QC, described in § 1236.42, are only two of the components of digitizing as a records management activity. In addition, you must:

(1) Account for all records included in the project's scope prior to digitization. You should note any missing records or records being retained in their original form in the details section of the Electronic Records Archives (ERA) Transfer Request (TR) instrument and include scans of any charge-out documentation so that skipped or missing records can be inter-filed if they are transferred at a later date;

(2) Survey source records for items that require special handling and select equipment that safely digitizes the originals without damaging them during the scanning process;

(3) Capture all information in records or files, regardless of the original media type;

(4) Accurately capture administrative, descriptive, and technical metadata specified in § 1236.54, including access and use restrictions metadata;

(5) Determine and apply an appropriate method for associating digitized records with each other, when relevant (such as when digitizing each page of a paper document separately, or each document in a paper file folder separately). Acceptable methods include associating individual image files in a folder structure matching the original paper folder structure or utilizing file formats with support for multi-page files such as PDF or TIFF; and

(6) Ensure that each individual file is usable and that you will be able to locate, retrieve, present, and interpret it over time.

(c) You must also take steps to maintain intellectual and physical control of source records pursuant to 36 CFR 1222.34. In this regard, for each record series or file unit you plan to digitize, you must:

(1) Document the age, media types, dimensions, required level of detail, and condition of source records prior to digitization; and

(2) Institute procedures and controls that:

(i) Ensure you can locate, access, and digitize source records with appropriate safeguards against loss and damage;

(ii) Restrict and log access to records while they are being digitized to minimize the risk of unauthorized additions, deletions, or alterations; and

(iii) Ensure that staff appropriately digitize all records or, if you keep some records in their original format, maintain the association between the digitized and original records using the relationship metadata elements in § 1236.54(c). You should note any records that you do not digitize in the details section of the Electronic Records Archives (ERA) Transfer Request (TR) and include scans of any charge-out documentation so that skipped or missing records can be inter-filed if they are transferred at a later date.

#### **§ 1236.46 Project management and documentation requirements.**

(a) You must ensure that any projects to digitize records meet the parameters in this subpart, and the records are complete, unaltered, and meet all QA criteria.

(b) Accordingly, you must have the following documents when digitizing permanent records and retain them in association with the digitized records, as specified in § 1236.58(f):

(1) A defined project plan that identifies the:

(i) Record series or file units you will digitize (note any missing records in the details section of the ERA TR and provide scans, as outlined in § 1236.44(b)(1));

(ii) Estimated volume and media types of the original source records;

(iii) Image quality parameters you must meet to capture the appropriate level of detail present in the original in order to interpret the information in the records -- including resolution<sup>1</sup>, color, and tonal fidelity. *See* § 1236.50(c) for the minimum requirements for image quality

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<sup>1</sup> Higher spatial resolution provides more pixels, and generally will render finer detail of the original in the digital image, but not always. The actual rendition of fine detail is more dependent on the spatial frequency response (SFR) of the scanner or digital camera, the image processing applied, and the characteristics of the item being scanned. Adjusting resolution settings to capture the appropriate level of detail in the original source records provides appropriate resolution.

parameters. The color mode must be either color or grayscale; we do not accept bi-tonal mode for permanent records. You must digitize in color when the original source documents have color present;

(iv) Estimated date range of the source records; and

(v) Estimated storage requirements for the records once digitized (which may affect project decisions, such as compression and file format);

(2) Applicable NARA-approved records schedule(s);

(3) Any related finding aids, indexes, inventories, logs, registers, or metadata the agency uses to manage the records;

(4) QM plans describing QA objectives that achieve the requirements in §§ 1236.48 through 1236.54;

(5) QC procedures to identify and correct errors during digitization in accordance with the requirements in § 1236.56;

(6) QC reports identifying detected errors and remediation steps in accordance with the requirements in § 1236.56.

#### **§ 1236.48 File format requirements.**

(a) You must digitize, encode, retain, and transfer most paper-based documents in one of the following file formats, either uncompressed or using one of the specified lossless compression codecs:

**Table 1 to Paragraph (a)**

<b>Format Name and Version</b>	<b>Acceptable Lossless Compression Codecs</b>
TIFF 6.0	Uncompressed, LZW compression
JPEG2000 part 1	JPEG 2000 part 1 core coding system lossless compression.

Portable network graphics 1.2 (PNG)	DEFLATE (ZIP)
PDF/A-1	DEFLATE (ZIP)
PDF/A-2	DEFLATE, JPEG 2000 part 1 core coding system lossless compression.

(b) You must digitize, encode, retain, and transfer photographic print records in one of the following file formats, either uncompressed or with one of the specified lossless compression codecs:

**Table 2 to Paragraph (b)**

<b>Format Name and Version</b>	<b>Acceptable Compression Codecs</b>
TIFF 6.0	Uncompressed, LZW
JPEG2000 part 1	JPEG 2000 part 1 core coding system lossless compression.
Portable network graphics 1.2 (PNG)	DEFLATE

(c) You must transfer metadata specified in § 1236.54 table 1 to paragraph (c)(1), table 2 to paragraph (c)(2), and table 3 to paragraph (d) in comma separated values (CSV) format.

**§ 1236.50 Digitization requirements for permanent paper and photographic print records.**

(a) *Equipment requirements.* The equipment you use to digitize Federal records must be appropriate for the media type, capable of achieving documented project objectives, and meet the parameters specified in paragraph (c) of this section for paper records in good physical condition that are suitable for mass digitization or paragraph (d) of this section for photographic print

records and paper records that require higher resolution or color accuracy or that can't physically be digitized by mass digitization.

(1) The specifications in paragraph (c) of this section are applicable for paper records that are suitable for mass digitization using high-volume scanners. To be suitable for this set of standards, the records must be in good physical condition, with well-defined printed type (such as typeset, typed, laser-printed, etc.), and have moderate to high contrast between the ink of the text and the paper background.

(2) The specifications in paragraph (d) of this section are applicable for photographic prints and paper records that are old, brittle, or folded, or that could be damaged by high-speed equipment. For records in poor physical condition, agencies must use equipment that does not result in further damage. For records with poor legibility or diffuse characters (such as carbon copies, Thermofax/Verifax, etc.), handwritten annotations or other markings, low inherent contrast, staining, fading, halftone illustrations, or photographs, digitization equipment or record staging must be capable of capturing record content, including all text, any embossed seals, or other details that can't be digitized by mass digitization.

(3) For records where the smallest significant detail in a record is 1.0 mm or smaller, such as aerial photographs and topographic maps (which require a high degree of enlargement and precision regarding the dimensional accuracy of the scans when compared to textual documents or other types of photographs), you must use table 2 to paragraph (d) of this section, but you must set the resolution so that the MTF and SFR performance of the scanner exceeds the tolerance ranges in table 2. For many imaging devices, increasing the ppi settings may not increase the actual level of resolution or capture the desired detail. The equipment you select for digitizing records with fine detail must be capable of meeting the higher quality parameters.

(4) For records that can't be captured to the specifications in paragraph (c) or (d) of this section, such as records containing a high degree of fine detail or need for color accuracy, you must contact NARA.



(b) *Implementation requirements.* You must:

(1) Implement an image quality analysis process and use device-level reference targets to verify that digitization devices conform to imaging parameters in this subpart;

(2) Replace reference targets as they fade, or accumulate dirt, scratches, and other surface marks that reduce their usability;

(3) Regularly test equipment to ensure scanners and digital cameras/copy systems are performing optimally.

(i) You must scan a reference target containing a grayscale, color chart, and accurate dimensional scale at the beginning of each workday; and

(ii) Perform additional tests when you detect problems;

(4) Test equipment with the specific software/device driver combination(s) you use, and re-test after every software update;

(5) Ensure that equipment operation, settings, and image processing actions remain consistent for the entire batch and are applied to all images in the batch;

(6) Encode original image files using a compression type, and in a format, specified in § 1236.48, and with the resolution, color mode, bit depth, and color space specified in table 1 to paragraph (c) of this section;

(7) You must not reformat, use a lossy compression codec, or interpolate (upsample) files to meet the standards in this subpart; and

(c) *Digitizing requirements for mass digitization of paper records in good physical condition.* For these records, produce image files (as described in table 1 to paragraph (c)) at 300 ppi sized to the original document.

(1) Records suitable for the specifications in table 1 are paper records with well-defined printed type (such as typeset, typed, laser-printed, etc.), and with moderate to high contrast between the ink of the text and the paper background.

(i) Performance metric values for the tone response (OECF) (Lightness,  $L^*$ ) conform to the FADGI category for Federal textual records; and

(ii) These values are appropriate when original source records do not have visible content that is recorded in the same tone densities as the two darkest patches ( $L^*20$  and  $L^*21$ ) of the DICE target.

(2) The specifications in table 1 are not appropriate for records that include fine detail, require a high degree of color accuracy, or have other unique characteristics that cannot be captured using the specifications in this table, or that cannot safely undergo high-volume digitization because they are fragile, would be damaged, or have other physical conditions that do not lend themselves to high-volume or mass digitization.

(3) You must digitize in an RGB color mode when the original source paper records have color present. You may digitize non-photographic print paper records in grayscale mode if there is no color present.

(4) At a minimum, you must digitize the paper records covered by this paragraph to the following parameters:

**Table 1 to Paragraph (c)**

<b>Digital file specifications<sup>1</sup></b>	<b>Attributes</b>
Color mode <sup>2</sup>	RGB color or grayscale <sup>3</sup>
Bit depth	8- or 16-bit
Working color space	gray gamma 2.2, AdobeRGB1998, sRGB, ProPhoto, ECIRGBv2
Sampling Frequency <sup>4</sup>	$\geq 300$ ppi
<b>Performance evaluation technical parameters</b>	<b>Performance metric values Difference from aim (applies to <math>20 \leq L^* \leq 100</math>)</b>
Tone response (OECF) (Lightness, $L^*$ )	$-5 \leq L^* \leq 5$
White balance error ( $a^*b^*$ ) (applies only to nominal gray patches)	$-4 \leq a^*b^* \leq 4$

Non-uniformity (Lightness, L*)	$\leq 3\%$
Color encoding accuracy (mean $\Delta E_{2000}$ ) <sup>5</sup>	$\leq 5$
Color channel misregistration	$\leq 0.50$ pixel
MTF10 (10% SFR)	sampling efficiency $\geq 80\%$ and SFR response at half sampling frequency $\leq 0.3$
MTF50 (50% SFR)	50% of half sampling frequency: [35%,75%]
Reproduction scale accuracy	$< \pm 2\%$ of aim
Sharpening (maximum SFR)	$\leq 1.1$
[Noise] $\Delta L^*$ standard deviation	$\leq 2$

<sup>1</sup> Count values are expressed as 8-bit equivalents.

<sup>2</sup> Must digitize in color when the original source paper records have color present.

<sup>3</sup> We do not accept permanent records digitized in bi-tonal (black and white) mode.

<sup>4</sup> The sampling frequency and the image dimensions determine the total number of pixels in the image, but do not determine the actual level of detail captured by an image system. The Modulation Transfer Function (MTF) is the scientific method to evaluate the spatial resolution performance of an imaging system. The MTF concept is an objective method to determine spatial resolution that is more accurate, compared to subjective methods such as dots-per-inch (dpi) or visual observation bar target readings. Resolution is a measure of how well spatial details are preserved in an imaging system by evaluating a range of measurements and quantifying them in a functional curve MTF plot.

<sup>5</sup>  $\Delta E_{2000}$  is the specific formula used to calculate color difference for this metric.

(d) *Digitizing requirements for photographic prints, and paper records not suitable for mass digitization.* For these records, produce image files (as described in table 2 to paragraph (d)) at 400 ppi sized to the original document. You may need to apply higher resolution for some photographic prints to capture fine detail.

(1) The photographic print specifications also apply to manuscripts, illustrations, or graphics, as well as documents with poor legibility or diffuse characters, such as carbon copies, Thermofax, etc.

(2) You must digitize photographic prints (and items outlined in paragraph (d)(1) of this section), including monochrome and black and white originals, using RGB color mode (which captures nuances in black, gray, sepia, etc, as well as color contained in the original). Paper

records may be digitized in grayscale mode if there is no color present; if color is present, you must digitize them using RGB color mode.

(3) At a minimum, you must digitize all the records covered by this paragraph to the following parameters:

**Table 2 to Paragraph (d)**

<b>Digital file specifications<sup>1</sup></b>	<b>Attributes</b>
Color mode <sup>2</sup>	RGB color or grayscale <sup>3</sup>
Bit depth	24-bit
Color space	Gray gamma 2.2, AdobeRGB1998, ProPhoto, ECIRGBv2
Sampling frequency <sup>4</sup>	$\geq 400$ ppi minimum
<b>Performance evaluation technical parameter</b>	<b>Performance metric values</b>
Tone response (OECF) (Lightness, L*)	$\pm 5$ -count levels $\leq 4$
White balance error (a*b*)	$\pm 4$ -count levels $\leq 4$
Non-uniformity (Lightness, L*)	$< 3\%$
Color accuracy (mean $\Delta E_{2000}$ ) <sup>5</sup>	$< 4$
Color channel misregistration	$< 0.50$ pixel
MTF10 (10% SFR)	sampling efficiency $> 80\%$ and SFR response at half sampling frequency $< 0.3$
MTF50 (50% SFR)	50% of half sampling frequency: [35%,75%]
Reproduction scale accuracy	$< \pm 2\%$ of aim
Sharpening (maximum SFR)	$< 1.1$
Noise	$< 4$ -count levels
[Noise] $\Delta L^*$ standard deviation	$< 2$

<sup>1</sup> Count values are expressed as 8-bit equivalents.

<sup>2</sup> Must digitize photographic prints, manuscripts, etc., in color, even when originals are in black and white or monochrome. Must digitize other paper documents in color when the original source paper records have color present; otherwise, may digitize such paper records in grayscale.

<sup>3</sup> We do not accept permanent records digitized in bi-tonal (black and white) mode.

<sup>4</sup> The sampling frequency and the image dimensions determine the total number of pixels in the image, but do not determine the actual level of detail captured by an image system. The Modulation Transfer Function (MTF) is the scientific method to evaluate the spatial resolution performance of an imaging system. The MTF concept is an objective method to determine spatial resolution that is more accurate, compared to subjective methods such as dots-per-inch (dpi) or visual observation bar target readings. Resolution is a measure of how well spatial details are preserved in an imaging system by evaluating a range of measurements and quantifying them in a functional curve MTF plot.

<sup>5</sup>  $\Delta E_{2000}$  is the specific formula used to calculate color difference for this metric.

#### **§ 1236.52 Digitization requirements for permanent mixed-media files.**

(a) Related records may be managed together but stored on more than one media type.

For example, a “case file” may include paper records, on-line electronic records, and electronic records on storage media such as magnetic tapes or other optical media. This reflects the way agencies create, maintain, and use these records; these are mixed-media files.

(b) When digitizing files that fall within the scope of this subpart (see § 1236.40) but are part of a mixed-media file, you must:

(1) Assess any electronic records in the mixed-media file to determine if they are digitized copies of paper records.

(i) If they are not digitized versions of paper records, ensure the electronic records remain associated with the rest of the records in the original mixed-media file.

(ii) If they are digitized versions of paper records, determine whether they meet the digitization standards in this subpart. If so, ensure they remain associated with the rest of the records in the original mixed-media file. If not, re-digitize the original paper records to the standards of this subpart.

(2) Digitize any paper records and photographic prints in the mixed-media file according to standards in § 1236.50(c) and (d);

(c) You should contact the Records Management Policy and Standards Team at [rmstandards@nara.gov](mailto:rmstandards@nara.gov) for guidance on what to do with types of media in a mixed-media file that are outside the scope of this subpart, such as dynamic media, x-rays, negative or positive film, or other special media types.

## **§ 1236.54 Metadata requirements.**

(a) *General.* Whether embedded into image files or captured in a record-keeping system, metadata provides information explaining what each record contains, when and why it was created, what media it was recorded on, original dimensions, and whether any restrictions govern its use. Metadata also describes the digitization process and the technical attributes of the resulting electronic records. It is important to capture this information about original source records and about the intervening digitization steps because we will not have the original source records or other project documentation to use when maintaining the digitized versions as archival records in the future.

(1) You should consider business and legal needs when developing the project plan and how your agency will capture the metadata.

(2) Depending on your agency's existing record-keeping practices and level of intellectual control, you may use information from the record series, file unit, or project level as the source for administrative and descriptive metadata fields. If the components of a record have not been individually indexed with unique descriptions, you may apply the series or file unit level descriptions to all of the image files within that grouping. If the components of the record do not have individual titles, you must apply the item Record IDs instead.

(3) If you provide other metadata elements in addition to the metadata requirements in this subpart, we will accept that metadata as part of the transfer process.

(4) "Mandatory if applicable" instructions in the tables in this section mean that you must provide the metadata if the agency captures the metadata as part of its business processes. You do not have to create "mandatory if applicable" metadata as an extra step to transfer records to NARA.

(b) *Overall requirements.* You must:

(1) Capture the metadata specified by paragraphs (c), (d), and (e) of this section at the file or item level as part of the digitization project;

(2) When digitization and image processing are complete and when agencies determine that records are no longer in active use and no longer subject to changes that would alter a checksum, you must generate checksums and record them as technical metadata in a record-keeping system for each image file, and use them to monitor electronic records for corruption or alteration;

(3) Create file names and record IDs that are unique to each file (although you must capture other metadata at the file or item level, some might be common to multiple files or items, but not these two elements);

(4) Embed the metadata specified by paragraph (c) of this section in each image file, capture and maintain it in a record-keeping system, associate it with the records it describes, and keep it consistent and accurate in both places;

(5) Ensure that scanning equipment embeds the system-generated technical metadata specified by paragraph (e) of this section in each image file and that image processing does not alter or delete it;

(6) Transfer metadata specified by paragraphs (c) and (d) of this section to NARA in CSV format; and

(7) Retain documentation and information described in 36 CFR 1222.28 and associate it with the digitized records.

(c) *Administrative metadata.* (1) Capture in a record-keeping system and embed in each image file the following administrative metadata:

**Table 1 to Paragraph (c)(1)**

<b>Metadata Label</b>	<b>Description</b>	<b>Requirement level</b>
Identifier: File Name	The complete name of the computer file, including its extension.	Mandatory
Identifier: Record ID	The unique identifier assigned by an agency or a records management system. § 1236.20(b)(1)	Mandatory

	requires that agencies assign unique identifiers to each record.	
Identifier: Disposition Schedule Item #	The number assigned to the disposition schedule item to which the record belongs.	Mandatory
Relation: Has Part	A related record that is either physically or logically required in order to form a complete record. Mixed-media files that contain records on multiple media types should use this element to identify all components.	Mandatory if a record includes multiple parts, such as the component parts of a case file or mixed-media file
Relation: Is Part Of	A related record or file in which the described record is physically or logically included. Records that are components of mixed media files should use this element to indicate their status.	Mandatory if file is a component of a multi-part record

(2) Capture in a record-keeping system and embed in each file any of the following access and use restrictions metadata inherited from the original source records:

**Table 2 to Paragraph (c)(2)**

<b>Metadata Label</b>	<b>Required Fields</b>	<b>Description</b>	<b>Requirement level</b>
Access Restrictions	Access Restriction Status	Indicate whether or not there are access restrictions on the record.	Mandatory
	Specific Access Restriction	Specific access restrictions on the record, based on national security considerations ( <i>e.g.</i> , CNSI, CUI), donor restrictions, court orders, and other statutory or regulatory provisions, including Privacy Act and Freedom of Information Act (FOIA) exemptions.	Mandatory if access restriction exists
Use Restrictions	Use Restriction Status	Indicate whether or not there are use restrictions on the record.	Mandatory
	Specific Use Restriction	The type of use restrictions on the record, based on copyright, trademark, service mark, donor, or statutory provisions, including	Mandatory if use restriction exists



		Privacy Act and Freedom of Information Act (FOIA) exemptions.	
Rights: Rights Holder		A person or organization owning or managing intellectual property rights relating to the record.	Mandatory if there is a rights holder

(d) *Descriptive metadata.* Capture the following descriptive metadata from source records at the lowest level needed to support access and preservation and to maintain contextual information. Depending on your agency's existing record-keeping practices and level of intellectual control, you may use information from the record series, file unit, or project level as the source for administrative and descriptive metadata fields. If the components of a record have not been individually indexed with unique descriptions, you may apply the series or file unit level descriptions to all of the image files within that grouping. If the components of the record do not have individual titles, you must apply the item Record IDs instead. Retain the metadata in a record-keeping system for each image file:

**Table 3 to Paragraph (d)**

<b>Metadata Label</b>	<b>Description</b>	<b>Requirement level</b>
Title	A name given to the original record. If a name does not exist, the mandatory metadata element Identifier: Record ID serves as the title for the record.	Mandatory
Description	A narrative description of the content of the record, including abstracts for document.	Mandatory
Creator	The agent (person, agency, other organization, etc) primarily responsible for creating the original record.	Mandatory
Date: Creation Date	The date or date range indicating when the original record met the definition of a Federal record.	Mandatory
Source Type	The medium of the original source record scanned to create a digital still image.	Mandatory

Source Dimensions	The dimensions of the original source record (including unit of measure).	Mandatory
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(e) *Technical metadata.* (1) Technical metadata is the metadata the scanning equipment generates during the digitization process.

(2) Embed image files with the following technical metadata describing the digitization process and the resulting electronic records, and ensure that image processing does not delete or alter it:

**Table 4 to Paragraph (e)(2)**

<b>Metadata Label</b>	<b>Definition</b>	<b>Requirement level</b>
File Size	The size in bytes of the image file.	Mandatory
Format Name and Version	The format name or description of the file format.	Mandatory
Image Width	The width of the digital image, <i>i.e.</i> , horizontal or X dimension, in pixels.	Mandatory
Image Height	The height of the digital image, <i>i.e.</i> , vertical or Y dimension, in pixels.	Mandatory
Color Space	The well-defined name of the International Color Consortium (ICC) profile used.	Mandatory
Date and Time Created	The Date or Date Time the digital image was created.	Mandatory
Scanner Make and Model	The manufacturer and model of the scanner used to create the image.	Mandatory if using a scanner
Scanning Software Name and Version	The name and version of the software the scanner uses to create the image.	Mandatory if using scanning software
Digital Camera Make and Model	The manufacturer and model of the digital camera used to create the image.	Mandatory if using a digital camera
Samples Per Pixel	The number of color components per pixel.	Mandatory

(3) When digitization and image processing are complete and when you determine that the records are no longer in active use and no longer subject to changes that would alter a

checksum, you must generate checksums, record them as technical metadata in a record-keeping system for each image file, and use them to monitor electronic records for corruption or alteration:

**Table 5 to Paragraph (e)(3)**

<b>Fixity Metadata Label</b>	<b>Description</b>	<b>Requirement level</b>
Message Digest Algorithm	The specific algorithm used to construct the message digest for the digital object or bitstream.	Mandatory
Message Digest (checksum)	The output of Message Digest Algorithm.	Mandatory

(f) *Transfer metadata.* (1) When you transfer digitized records to NARA's legal and physical custody, you must also transfer the associated metadata specified by paragraphs (c), (d), and (e) of this section.

(2) In addition, you will need to enter the following separate metadata into the Electronic Records Archive (ERA) when you create the Transfer Request (TR) to begin transferring the records:

**Table 6 to Paragraph (f)(2)**

<b>Metadata Label</b>	<b>Required Fields</b>	<b>Description</b>	<b>Requirement level</b>
Transfer Title	Transfer Title	The name assigned to the collection, set or series of records you are transferring to NARA.	Mandatory
Dates	Inclusive Start Date	The beginning date on which the record group, collection, series, or set you are transferring to NARA was created, maintained, or accumulated by the creator.	Mandatory
	Inclusive End Date	The last date on which the record group, collection, series, or set you are transferring to NARA was created, maintained, or accumulated by the creator.	Mandatory

Creating Organization	Creating Organization	The name of the organization responsible for creating, accumulating, or maintaining the collection, series, or set when in working (primary) use.	Mandatory
Record Group Number	Parent Record Group Number	The unique number assigned to a record group.	Mandatory
General Records Type	General Records Type	The general form of the records set, series, or collection you are transferring, such as: architectural and engineering drawings, artifacts, data files, maps and charts, moving images, photographs and other graphic materials, sound recordings, textual records, or web pages.	Mandatory
Access Restrictions	Access Restriction Status	Indicate whether or not there are access restrictions on the set, collection, or series of records you are transferring to NARA.	Mandatory
	Specific Access Restriction	Specific access restrictions on the set, collection, or series of records, based on national security considerations ( <i>e.g.</i> , CNSI, CUI), donor restrictions, court orders, and other statutory or regulatory provisions, including Privacy Act and Freedom of Information Act (FOIA) exemptions.	Mandatory if access restriction exists
Use Restrictions	Use Restriction Status	Indicate whether or not there are use restrictions on the set, collection, or series of records you are transferring to NARA.	Mandatory
	Specific Use Restriction	The type of use restrictions on the set, collection, or series of records, based on copyright, trademark, service mark, donor, or statutory provisions, including Privacy Act and Freedom of Information Act (FOIA) exemptions.	Mandatory if access restriction exists
Record Schedule Number	Records Schedule Number	The number NARA assigned to the record schedule that applies to all the records in the collection, series, or set you are transferring.	Mandatory

**§ 1236.56 Quality control (QC) inspection requirements.**

(a) You must design a QC plan to document and correct errors due to malfunctioning or improperly configured digitization equipment, improper software application settings, incorrect metadata capture, or human error. You should perform QC inspections of files for compliance with all parameters and criteria identified for QA in parts §§ 1236.48 through 1236.54.

(b) You must select equipment that meets or exceeds identified parameters. To determine that digitization devices are capable of meeting imaging parameters, you must conduct an image quality analysis process and use device-level reference targets.

(c) QC procedures must verify that digital image files:

(1) Meet file format requirements specified in § 1236.48,

(2) Comply with the file attribute and technical evaluation parameter tolerance ranges specified in § 1236.50, and

(3) Meet the metadata requirements specified in § 1236.54.

(d) You must inspect a random sample of either ten images or 10% of each batch of digital images, whichever is larger, for the following characteristics:

(1) *File quality*: You can open and view the files; they are well-formed according to the specified file format in § 1236.48; they have the correct pixel dimensions; they are encoded with the correct color mode, bit depth, color profile, and ,if compressed, they are compressed as specified in § 1236.50. You may verify file quality using automated techniques.

(2) *Image quality*: Ensure that digital files meet image quality parameters (spatial resolution, image tone, brightness, contrast, and color accuracy) specified in § 1236.50; that the files have no clipping (missing detail lost in highlights or shadows), channel misregistration, or quantization errors; and that the informational content of the record is not compromised by excessive image artifacts (dust, Newton’s rings, missing pixels, scan lines, drop-outs, flare, or over-sharpening).

(i) You should inspect image quality attributes on a color-managed computer.

(ii) Perform a visual review to assure images are accurate and consistent. Verify the files are not dimensionally distorted, have correct orientation (portrait/vertical, landscape/horizontal, horizontally or vertically flipped), and informational content is not cropped.

(iii) Conduct visual evaluation of images at 100% magnification on a color-managed computer monitor.

(iv) In addition to conducting visual inspections, you may also verify digital file specifications using automated techniques.

(v) Conduct manual QC inspections to evaluate subjective factors, such as appearance or legibility.

(3) *Metadata quality*: Ensure that files are named according to project specifications, that correct administrative, descriptive, and technical metadata are captured in a record-keeping system, and correct metadata elements are embedded in file headers.

(i) You must conduct manual QC inspections to evaluate the accuracy of metadata.

(ii) You may also evaluate the accuracy of metadata using automated techniques, if applicable.

(4) If you detect errors during inspection, perform the following steps to ensure that the specifications and requirements in §§ 1236.41 through 1236.56 have been met:

(i) If 1% or more of examined records fail to meet any of the criteria in this subpart, determine the source and scope of any errors, correct or re-digitize affected records, and conduct additional inspections of 10% random samples until you achieve a 100% success rate for the sample set;

(ii) If less than 1% of examined records fail to meet any of the criteria in this subpart, determine the source and scope of any errors and correct or re-digitize the affected records.

(e) You must conduct a QC inspection for completeness. You must:

(1) Employ automated and visual inspection processes to verify record completeness;

(2) Visually compare source records with their digitized versions to verify that 100% of the source materials have been captured and accounted for, and that the digitized records are in the same order as the original;

(3) Verify that all records have been accounted for by referring to box lists, folder title lists, or other inventories;

(4) Verify that all sources of record information have been digitized by examining records for related envelopes, notes, or other forms of media. If another form of media is present that cannot be digitized, associate it with the digitized records using the Relation metadata elements in 1236.54(c); and

(5) Identify and document any missing pages or images (and you will note this information in the Details section of the ERA Transfer Request (TR) when transferring the records).

#### **§ 1236.58 Validating digitized records and disposition instructions.**

(a) When you complete a digitization project, you must validate that the digitized versions meet the standards in §§ 1236.41 through 1236.56.

(b) The validation should be conducted by separate staff, independent from the staff that performed the digitization QC inspections described in § 1236.56.

(c) To conduct the validation, you must verify that:

(1) All records identified in the project's scope have either been digitized or were originally identified in project documentation as missing or incomplete records (and you will note this information in the Details section of the ERA Transfer Request (TR) when transferring the records);

(2) All required metadata is accurate, complete, and correctly labeled;

(3) All image technical attributes specified in § 1236.50 have been met;

(4) All image files are legible and the smallest level of detail necessary to understand and use the records has been captured;

(5) Mixed-media files are digitized appropriately for the material type, or if mixed-media components are retained in their original format, they are associated with digitized components through metadata, per the requirements specified in § 1236.54; and

(6) Project documentation has been created according to § 1236.46.

(d) After validating, you must determine whether or not the agency has any reasons for retaining the original source records for a period of time once digitized. See § 1236.40(f).

(e) After validating, you may dispose of the original source records pursuant to a NARA-approved records schedule that addresses disposition after digitization.

(f) Agencies cannot use the GRS to dispose of original source records if the digitized records do not meet the requirements in this subpart. In such cases, agencies should contact the Records Management Policy and Standards Team at [rmstandards@nara.gov](mailto:rmstandards@nara.gov) to determine what steps they must take to be able to transfer the records to the National Archives.

(g) Agencies must retain the project documentation described in § 1236.46 until the National Archives confirms receipt of the records and legal custody of the records has been transferred.

(h) Agencies must transfer the administrative, technical, and descriptive metadata captured during the digitization project, as defined in § 1236.54, with the digitized records.

DAVID S. FERRIERO,

Archivist of the United States.

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